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ABSTRACT

This paper examines potential relationships between students' reading proficiency and performance in general psychology classes. The primary research objective was to determine if there existed a relationship between reading level, as measured by a student's initial ACCUPLACER reading placement, and performance in a general psychology class, as measured by final course grade. Successful performance in general psychology consisted of course grades A, B, or C; unsuccessful performance consisted of course grades D, F, PR, or W. Analyses of the data showed that the relationship between reading level and performance in General Psychology, as defined by success rates, was not significant. However, significant differences in performance outcomes were observed for students who had developmental (Reading 030 and below) and non-developmental (Reading 513 and 100) reading placements. When the analysis was restricted to students who received grades that were used to calculate grade point average, the data showed that non-developmental students received significantly higher grades than developmental students. The mean grades received in general psychology by developmental (1.76=D) and non-developmental reading students (2.36=C) differed significantly. To obtain a more accurate measure of student reading ability, it is important that ACCUPLACER reading placements are adjusted to incorporate instruction in developmental reading coursework. (JA)

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PERFORMANCE IN GENERAL PSYCHOLOGY AND READING LEVEL (FALL 2000, FOREST PARK CAMPUS)

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PERFORMANCE IN GENERAL PSYCHOLOGY AND READING LEVEL
FALL 2000, FOREST PARK CAMPUS

INTRODUCTION

A professor-investigator compared student success rates in General Psychology classes with student reading levels. In this initial analysis of reading ability and performance in General Psychology, the professor defined successful performance as course grades *A*, *B*, or *C* and unsuccessful performance as course grades *D, F, W*, or *PR*. Determined by their scores on the ACCUPLACER reading subtest, the students' reading placements were used to assign their reading levels, that is:

Reading 513 (Critical Thinking)
Reading 100 (College Reading and Study Skills)
Reading 030 (Introduction to College Reading)
Reading 020 (Reading Improvement)
Reading 016 (Developmental Reading)
Reading 012 (Basic Reading Skills).

An examination of the data compiled by the professor-investigator pointed to a positive association between student performance in General Psychology and reading proficiency. Subsequently, the professor requested that the Office of Institutional Research and Planning perform additional analyses of the data to ascertain the extent to which reading skills determine performance in General Psychology. A summary of the professor's initial findings is reported in Appendix A.

RESEARCH OBJECTIVES

To explore any potential relationship between reading proficiency and performance in General Psychology and to obtain additional information useful in understanding the student outcomes, several research questions were examined in this study:

1. **ACCUPLACER Placements and General Psychology.** Is there a relationship between reading proficiency as measured by the initial ACCUPLACER reading score and performance in General Psychology?

2. **Reading Remediation Placements and General Psychology**: **Effects of Developmental Coursework**. Is there a relationship between performance in General Psychology and reading level when outcomes in reading developmental courses are used to adjust reading levels?

3. **Withdrawals:** What are the reading levels of the students who withdrew from the professor's General Psychology classes? Did students with reading placements within the developmental range withdraw at higher rates than those with reading placements within the college range?

METHOD AND RESULTS

According to data stored on the SLCC student record system, there were 146 students enrolled in the professor's General Psychology classes. However, only 105 of these students have ACCUPLACER reading scores. Therefore, 41 of the educator's students do not have ACCUPLACER reading placements.

ACCUPLACER Placements and General Psychology.

The primary research objective is to determine if there exists a relationship between reading level, as measured by a student's initial ACCUPLACER reading placement, and performance in General Psychology, as measured by final course grade.

Table 1 provides the distribution of final course grades and success rates at each reading level. The final course grades and success rates for students who do not have a reading level assignment (No Reading Test) are also provided in Table 1. Consistent with the professor-investigator's approach, successful performance in General Psychology consists of course grades *A*, *B*, or *C* and unsuccessful performance consists of course grades *D*, *F*, *PR*, or *W*. In this educator's General Psychology classes, 74 students were successful and 72 students were unsuccessful; thus, the overall success rate (50.7) and failure rate (49.3) are roughly equivalent. To examine the relationship between reading proficiency and performance outcomes in General Psychology, subsequent analyses exclude students who do not have ACCUPLACER reading placements.

Table 1. Students' ACCUPLACER Reading Placements, Final Grades and Success Rates in a Professor's General Psychology Classes (Fall 2000, Forest Park Campus)

Reading Placement	Total Number / Percent	General Psychology Performance Course Grade & Success Rate (Number/ Percent)								
		Successful				Unsuccessful				
		A	B	C	Rate	D	F	PR	W	Rate
Reading 513: Critical Thinking	44 30.1	13 29.5	7 15.9	6 13.6	**26 59.1**	3 6.8	7 15.9	0 0.0	8 18.2	**18 40.9**
Reading 100: College Reading and Study Skills	9 6.2	1 11.1	3 33.3	1 11.1	**5 55.5**	1 11.1	2 22.2	1 11.1	0 0.0	**4 44.4**
Reading 030: Introduction to College Reading	31 21.2	5 16.1	4 12.9	4 12.9	**13 41.9**	3 9.7	8 25.8	0 0.0	7 22.6	**18 58.1**
Reading 020: Reading Improvement	15 10.3	0 0.0	2 13.3	3 20.0	**5 33.3**	3 20.0	2 13.3	0 0.0	5 33.3	**10 66.6**
Reading 016: Developmental Reading	4 2.7	1 25.0	0 0.0	0 0.0	**1 25.0**	1 25.0	0 0.0	0 0.0	2 50.0	**3 75.0**
Reading 012: Basic Reading Skills	2 1.4	0 0.0	0 0.0	1 50.0	**1 50.0**	0 0.0	0 0.0	0 0.0	1 50.0	**1 50.0**
No Reading Test	41 28.1	8 19.5	8 19.5	7 17.1	**23 56.1**	3 7.3	6 14.6	0 0.0	9 22.0	**18 43.9**
Total	146 100.0	28 19.2	24 16.4	22 15.1	**74 50.7**	14 9.6	25 17.1	1 0.0	32 21.9	**72 49.3**

Note. Percent totals that differ from 100 are due to rounding error.

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Table 2 permits a comparison of student success rates at each reading level. However, unlike the professor-investigator's findings reported in Appendix A, an analyses of the data in Table 2 shows that the relationship between reading level and performance in General Psychology, as defined by success rates, is not significant (Chi-square: $\chi 2 = 4.62$, $p > .05$, $df=3$).

Table 2. Students' ACCUPLACER Reading Placements and Rates of Performance in a Professor's General Psychology Classes (Fall 2000, Forest Park Campus)

Reading Placement	Total		General Psychology Success Rates			
			Successful		Unsuccessful	
	Number	Percent	Number	Percent	Number	Percent
Reading 513: Critical Thinking	44	41.9	26	59.1	18	40.9
Reading 100: College Reading and Study Skills	9	8.6	5	55.6	4	44.4
Reading 030: Introduction to College Reading	31	29.5	13	41.9	18	58.1
Reading 020: Reading Improvement & Below	21	20.0	7	33.3	14	66.7
Total	105	100.0	51	48.6	54	51.4

Note. Successful Performance in General Psychology: Grades A, B, C; Unsuccessful Performance in General Psychology: Grades D, F, W, PR. Reading courses below Reading 020 include Reading 016 (Developmental Reading) and Reading 012 (Basic Reading Skills).

However, significant differences in performance outcomes are observed for students who have developmental (Reading 030 and below) and non-developmental (Reading 513 and 100) reading placements. When the analysis is restricted to students who received grades that are used to calculate grade point averages (*A, B, C, D,* and *F*), a customary practice, the data shows that non-developmental students receive significantly higher grades than developmental students (See Table 3). The mean grades received in General Psychology by developmental (1.76, D) and non-developmental reading students (C, 2.36) differ significantly [t (79) = 1.83, p <.05 (one-tailed test)].

Table 3. Mean Course Grades of Developmental and Non-Developmental Reading Students Enrolled in a Professor's General Psychology Classes (Fall 2000, Forest Park Campus).

ACCUPLACER Reading Placement	Number	Mean Course Grade	Standard Deviation
Developmental Reading Students	37	1.76	1.42
Non-developmental Reading Students	44	2.36	1.53

t = 1.83, p <.05 (one-tailed test), degrees of freedom = 79, N = 81.

Note. These placements are based upon the student's initial ACCUPLACER scores and do not reflect student outcomes in developmental reading coursework. Developmental Reading Students: Placements at Reading 030 (Introduction to College Reading); Reading 020 (Reading Improvement); Reading 016 (Developmental Reading); and Reading 012 (Basic Reading Skills). Non-developmental Reading Students: Placements at Reading 513 (Critical Thinking) and Reading 100 (College Reading and Study Skills).

Because these results exclude students who received either a *W* (withdrawal) or a *PR* (progress re-enrol!), the sample size is reduced from 105 to 81. The findings concerning the 23 students with ACCUPLACER reading placements who withdrew from the course are discussed in the final part of this section; only 1 student received a *PR* in the course. Further, these findings are based upon the students' initial ACCUPLACER scores and do not consider student outcomes in developmental reading coursework. Research findings that reflect instruction in developmental coursework are discussed below.

Adjusted ACCUPLACER Reading Placements and Success Rates in General Psychology: Effects of Developmental Coursework

To obtain a more accurate measure of student reading ability, it is important that ACCUPLACER reading placements are adjusted to incorporate instruction in developmental reading coursework. Therefore, an additional research question addresses the relationship between performance in General Psychology and adjusted ACCUPLACER placements, the levels of reading proficiency that reflect the students' successful completion of the prescribed reading remediation course(s). An examination

of the discrepancies in reading placements and reading course enrollments also is central to understanding the impact of reading remediation upon student outcomes in General Psychology.

Table 4. ACCUPLACER Developmental Reading Placements for Students Enrolled in a Professor's General Psychology Classes (Fall 2000, Forest Park Campus)

ACCUPLACER Developmental Reading Placement	Total Course Placements
Reading 012: Basic Reading Skills	2
Reading 016: Developmental Reading	4
Reading 020: Reading Improvement	15
Reading 030: Introduction to College Reading	31
Total Developmental Placements	52

As shown in Table 4, 52 students received developmental reading placements. A sign test indicates that the significant majority of these developmental reading students (N =35) enrolled in reading courses that matched their ACCUPLACER reading scores (Sign test, p = .0023). However, as concerns the discrepancies (students whose enrollments in reading remediation courses were not consistent with their ACCUPLACER scores), there were significantly more negative variations (N =15) than positive variations (N=2). Negative variations consist of both students who failed to enroll in a reading developmental course (N=11) and students who enrolled in a developmental reading course that was above their placement score (N=4). It is noteworthy, however, that only 11 developmental students did not enroll in developmental coursework. Positive variations consists of students who enrolled in courses below their reading placement score.

As concerns adjustments in ACCUPLACER placements due to reading instruction, the initial placements were moved to the next level if the student successfully completed the prescribed, lower level reading course, that is, if the student received either an A, B, or C in the lower level reading course. For example, if a student successfully completed Reading 030 (Introduction to College Reading), the student's reading placement was moved to Reading 100 (College Reading and Study Skills).

Table 5 permits a comparison of the initial distribution of ACCUPLACER reading placements with the adjusted distribution, which reflects outcomes of reading instruction. The findings are again based upon data from 81 students, which excludes the students who received either a *W* (withdrawal) or a *PR* (progress re-enroll). As Table 5 indicates, the percentages of developmental (Reading 030, Reading 020 and Reading 016 and 012) Below) and non-developmental students (Reading 513 and Reading 100) differ substantially within the two distributions.

When considering the unadjusted (initial) AACUUPLACER placements, there are roughly equal numbers of developmental (45.6 %) and non-developmental (54.3%) reading placements. However, when outcomes in reading instruction are taken into account, the relative numbers of developmental and non-developmental reading placements shifts dramatically; and approximately 82% of the professor's students now have non-developmental reading placements. In this respect, at the time of instruction in General Psychology, the significant majority of the professor's students had reading placements at college level [Reading 100 (30.9%) and Reading 513 (50.6%)].

Table 5. Initial ACCUPLACER Reading Placements and Adjusted ACCUPLACER Reading Placements of Students Enrolled in a Professor's General Psychology Classes (Fall 2000, Forest Park Campus).

Reading Placement	Initial ACCUPLACER Placement		Adjusted ACCUPLACER Placement (Reading Instruction)	
	Number	Percent	Number	Percent
Reading 513: Critical Thinking	36	44.4	41	50.6
Reading 100: College Reading and Study Skills	8	9.9	25	30.9
Reading 030: Introduction to College Reading	24	29.6	11	13.6
Reading 020: Reading Improvement	10	12.3	3	3.7
Reading 016 and 012 (Developmental Reading and Basic Reading Skills)	3	3.7	1	1.2
Total	81	100	81	100.0

Note. Percent totals that differ from 100 are due to rounding error.

Because less than 20% of the educator's students read below college level when placements are adjusted using outcomes in reading instruction, an analysis of the relationship between performance in General Psychology and reading proficiency is not warranted. However, Table 6 permits a comparison of course grades and success rates at each reading level.

Table 6. Students' Adjusted ACCUPLACER Reading Placements, Final Grades and Success Rates in a Professor's General Psychology Classes (Fall 2000, Forest Park Campus)

Reading Placement	Total Number / Percent	General Psychology Performance Course Grade & Success Rate (Number/ Percent)						
		Successful A	B	C	Rate	Unsuccessful D	F	Rate
Reading 513: Critical Thinking	41 50.6	13 31.7	8 19.5	7 17.1	**28 68.3**	4 9.8	9 22.0	**13 31.7**
Reading 100: College Reading and Study Skills	25 30.9	3 12.0	6 24.0	6 24.0	**15 60.0**	5 20.0	5 20.0	**10 40.0**
Reading 030: Introduction to College Reading	11 13.6	3 27.3	2 18.2	1 9.1	**6 54.5**	1 9.1	4 36.4	**5 45.5**
Reading 020: Reading Improvement	4 4.9	1 25.0	0 0.0	1 25.0	**2 50.0**	1 25.0	1 25.0	**2 50.0**
Total	81 100.0	20 24.7	16 19.8	15 18.5	**51 63.0**	11 13.6	19 23.5	**30 37.0**

Note. Percent totals that differ from 100 are due to rounding error.

Reading Placements of Students who Withdrew

An additional research question concerned potential differences in the withdrawal rates of developmental and non-developmental students: Did students with reading placements within the developmental range withdraw at higher rates than those with reading placements within the college range? Thirty-two (32) students withdrew from the educator's General Psychology classes, and 23 of these students have ACCUPLACER

reading scores. The initial and adjusted reading placements for the students who withdrew are provided in Table 7. For this subpopulation, the significant majority of reading placements shifts from developmental to non-developmental when the initial placements are adjusted for reading instruction. Specifically, approximately 65% of the students who withdrew have ***initial*** placements within the developmental range (Reading 030, 020 and 016 and below); however, when reading instruction is accounted for, approximately 74% have college level reading placements (Reading 100 and 513). Therefore, the research question concerning differences in withdrawal rates is not meaningful because students who withdrew also typically read at college level.

Moreover, the relative number of college level readers among students who withdrew (74%) does not differ appreciably from the relative number of college level readers among students who received GPA grades, *A, B, C, D or F* (82%). See discussion above.

Table 7. Initial ACCUPLACER Reading Placements and Adjusted ACCUPLACER Reading Placements of Students who Withdrew from a Professor's General Psychology Classes (Fall 2000, Forest Park Campus).

Reading Placement	Initial ACCUPLACER Placement		Adjusted ACCUPLACER Placement (Reading Instruction)	
	Number	Percent	Number	Percent
Reading 513: Critical Thinking	8	34.8	10	43.5
Reading 100: College Reading and Study Skills	0	0.0	7	30.4
Reading 030: Introduction to College Reading	7	30.4	4	17.4
Reading 020: Reading Improvement	5	21.7	0	0.0
Reading 016 and 012 (Developmental Reading and Basic Reading Skills)	3	13.0	2	8.7
Total	23	100.0	23	100.0

Note. Percent totals that differ from 100 are due to rounding error.

CONCLUSIONS

While definitive conclusions must be based upon results acquired using a representative campus and/or district-wide sample, these research results obtained from the analysis of performance outcomes in the professor's General Psychology classes provide some support for the following conclusions:

1. While there is room for improvement, the reading policies concerning enrollment in reading developmental coursework are generally followed at the Forest Park campus. Only 21% of the professor's developmental reading students (11 of 52) failed to enroll in the prescribed developmental coursework.

2. When only ***initial*** ACCUPLACER reading placements are used to determine reading level, non-developmental reading students receive significantly higher grades in General Psychology than developmental reading students, the mean grades received are C and D, respectively.

3. When ***developmental reading coursework is accounted for***, the significant majority of the students enrolled in General Psychology are reading at college level.

4. Students who withdraw from General Psychology do not have lower reading placements than those who complete the course, either successfully or unsuccessfully. Regardless as to grade received (***A, B, C, D, F or W***), students enrolled in General Psychology read at or above college level, when reading placements are adjusted to reflect successful completion of developmental coursework.

RECOMMENDATIONS

Research shows that other aspects of reading ability are important for performance in college level coursework. The Northwest Regional Educational Laboratory (http://www.nwrel.org/eval/reading), for example, has identified three barriers to content area-reading comprehension:

1. Understanding of text features and construction of informational texts
2. Prior knowledge, content knowledge and thematic knowledge of content area subjects
3. Content-specific vocabulary.

It may be useful to identify the extent to which these barriers are operative in General Psychology; and, as dictated by these findings, develop and/or select strategies to help students overcome the impediments to reading comprehension.

While a more thorough review of the empirical literature is required, an examination of selected articles and digests indicates there are research findings that will facilitate the students' acquisition and comprehension of psychological terminology.
In their ERIC digest articles, Carl B. Smith (*Vocabulary Instruction and Reading Comprehension, 1997)* and Christen L. Williams and Thomas J. Murphy (*Increasing Comprehension by Activating Prior Knowledge, 1991*) discuss specific instructional strategies for implementing vocabulary teaching.

The instructional strategies reported in the ERIC literature reviews were developed primarily from observations of students at the intermediate through high school levels; however, the strategies (such as vocabulary matrices, webbing techniques, semantic associations, semantic mapping, analogies, and case-based instruction) are also applicable at the college level. Further, it is important to emphasize that computer/web-based instructional materials are potential resources to preteach vocabulary and to enrich and/or build background knowledge. An annotated bibliography of additional references is provided below.

ANNOTATED BIBLIOGRAPHY: READING IN THE CONTENT AREA OF PSYCHOLOGY

Brothen, T., & Wambach, C. (2000). Using factual study questions to guide reading and promote mastery learning by developmental students in an Introductory Psychology course. *Journal of College Reading and Learning*, 30(2), 158-66, Spring.

Abstract: The article contains a report of an evaluation of factual study questions as a component of an introductory psychology course taught to developmental students with a computer-assisted, mastery learning teaching method based on Keller's (1968) Personalized System of Instruction (PSI). The authors recommend that instructors of introductory courses, especially those that serve developmental students, create and use factual study questions.

Griggs, R. A. (1999). Introductory Psychology Textbooks: Assessing levels of difficulty. *Teaching of Psychology*, 26(4), 248-53.

Abstract: Griggs attempts to facilitate the text selection process for introductory psychology teachers by enabling them to match the level of the text with their students' ability level. The author examines 37 introductory psychology textbooks published from 1995-1997 to determine text levels (high, middle, or lower level). The educator discusses the findings in detail.

Roberts, M. S., et al. (1990). Reading ability as a performance predictor in a behaviorally based psychology course. *Teaching of Psychology*, 17(3), 173-175.

Abstract: This research study examines how reading ability relates to course performance in an introductory developmental psychology course. Student outcomes in personalized system of instruction (PSI) course sections are compared to student outcomes in contingency managed lecture (CML) sections. The results show that previous academic performance best predicted final examination scores for CML students while reading comprehension best predicted PSI student performances. The results suggest that lecture format may benefit students with deficient reading skills.

Steuer, F. B. (1996). Reading in the undergraduate psychology curriculum. *Teaching of Psychology*, 23(4), 226-30.

Abstract: The author provides an overview of the recent research concerning the application, benefits, and deficiencies regarding critical-reading skills and college instruction. The educator discusses how reading skills support cognitive processes necessary for acquiring psychological knowledge. Steuer also delineates the differences between narrative (story- like, believable) reading and paradigmatic (formal, logical) reading.

APPENDIX A

The data set used in the initial analysis conducted by the professor-investigator are summarized in the table below. The professor defined successful performance as course grades *A, B, or C* and unsuccessful performance as course grades *D, F, W, or PR.* As Table A1 shows, the student success rates decline rapidly from the highest to the lowest reading placement levels, that is, 60.9 (Reading 513), 55.0 (Reading 100), 41.9 (Reading 030) and 20.0 (Reading 020 and below).

An additional analysis of this data shows that success in General Psychology does depend upon level of reading proficiency (Chi-square: $\chi 2 = 8.79$, $p < .05$, $df=3$).

An analysis of the data set obtained from the student record system is summarized in the body of this document.

Table A1. Students' ACCUPLACER Reading Placements and Rates of Performance in a Professor's General Psychology Classes (Fall 2000, Forest Park Campus)

Reading Placement	Total		General Psychology Success Rates			
			Successful		Unsuccessful	
	Number	Percent	Number	Percent	Number	Percent
Reading 513: Critical Thinking	46	37.1	28	60.9	18	39.1
Reading 100: College Reading and Study Skills	20	16.1	11	55.0	9	45.0
Reading 030: Introduction to College Reading	43	34.7	18	41.9	25	50.1
Reading 020: Reading Improvement & Below	15	12.1	3	20.0	12	80.0
Total	124	100.0	60	48.4	64	51.6

Note: Successful performance in General Psychology: Grades A, B, C. Unsuccessful performance in General Psychology: Grades D, F, W, PR. Reading courses below Reading 020 include Reading 016 (Developmental Reading) and Reading 012 (Basic Reading Skills).